

**What Is Claimed Is:**

1. An apparatus for displaying a three-dimensional image, which synthesizes two-dimensional microimages and regenerates them in a three-dimensional image, the apparatus comprising:

5 a detector for tracing movement of an observer head that observes the three-dimensional image, in real time and detecting the position of the observer head; and

10 a compensator for adjusting a viewing zone of the three-dimensional image and/or compensating distortion of the three-dimensional image in accordance with a signal input from the detector.

15 2. The apparatus of claim 1, wherein the detector includes a head tracking system which traces movement of the observer head in real time, and a head position detector for calculating the position of the observer head traced by the head tracking system.

20 3. The apparatus of claim 1, wherein the compensator includes either a viewing adjust engine which adjusts the viewing zone of the three-dimensional image by moving the microimages in accordance with a signal input from the head position detector, or an aspectogram regeneration engine which regenerates the microimages in accordance with the signal input from the head position detector to compensate distortion of the three-

dimensional image.

4. An apparatus for displaying a three-dimensional image, comprising:

5 an aspectogram containing a plurality of two-dimensional microimages displayed in real time;

a microlens array for synthesizing the two-dimensional microimages and regenerating them in a three-dimensional image;

10 a head tracking system for tracing movement of an observer head that observes the three-dimensional image, in real time;

a head position detector for calculating the position of the observer head traced by the head tracking system; and

15 a viewing adjust engine for adjusting a viewing zone of the three-dimensional image by moving the microimages in accordance with a signal input from the head position detector.

5. The apparatus of claim 1, further comprising an aspectogram regeneration engine which regenerates the microimages in accordance with the signal input from the head position detector to compensate distortion of the three-dimensional image.

6. The apparatus of claim 5, wherein the regenerated microimages are moved to form a new viewing zone centered relative to the moved observer head by the viewing adjust engine.

7. An apparatus for displaying a three-dimensional image,  
comprising:

an aspectogram containing a plurality of two-dimensional  
5 microimages displayed in real time;

a microlens array for synthesizing the two-dimensional  
microimages and regenerating them in a three-dimensional image;

a head tracking system for tracing movement of an observer  
head that observes the three-dimensional image, in real time;

10 a head position detector for calculating the position of  
the observer head traced by the head tracking system; and

an aspectogram regeneration engine for regenerating the  
microimages in accordance with a signal input from the head  
position detector to compensate distortion of the three-  
15 dimensional image.

8. The apparatus of claim 7, further comprising a viewing  
adjust engine which adjusts a viewing zone of the three-  
dimensional image by moving the regenerated microimages to form a  
20 new viewing zone centered relative to the moved observer head in  
accordance with a signal input from the head position detector  
and the aspectogram regeneration engine.

9. A method for displaying a three-dimensional image, which synthesizes two-dimensional microimages and regenerates them in a three-dimensional image, the method comprising the steps of:

tracing movement of an observer head that observes the  
5 three-dimensional image, in real time;

calculating the position of the traced observer head; and

adjusting a viewing zone of the three-dimensional image  
and/or compensating distortion of the three-dimensional image, in  
accordance with the calculated position of the observer head.

10. The method of claim 9, wherein the step of adjusting  
the viewing zone of the three-dimensional image includes the step  
of forming a new viewing zone centered relative to the moved  
observer head by moving the two-dimensional microimages.

11. The method of claim 9, wherein the step of compensating  
distortion of the three-dimensional image includes the step of  
regenerating the two-dimensional microimages.